SCHATZ PLANT SITE SUBSURFACE SOIL ASSESSMENT

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Approach/Method

- Schatz Plant site operated a bearing manufacturing from at least 1912 (oldest surviving building) to 1980 when the plant ceased manufacturing operations.
- The plant expanded its operations in to 1942, the construction age of the most recent building. Based on these factors, it was decided to collect subsurface samples from beneath each successive additions; the premise being that each addition may have been erected over disposal and contaminated areas.
- After studying the facility architectural features such as headers and construction techniques employed, an inference was made as to location of each addition. Subsequently, tax maps from 1930 and 1938 were found in one of the offices. The visual observations correlated with the information found on the maps. The two tax maps also identified the age of each addition.
- The manufacturing process entailed the use of cutting oils and heat treating oils. According to accounts by former employees, the oils were distributed throughout the facility using a network of pipes. The machineries incorporating the use of cutting oils were positioned over channels in the concrete floor. The spent cutting oil would then be channeled to a central collecting pit and then transferred to several holding tanks. After filtering, the cutting oil would be reused. This process continued till the cutting oil was no longer viable.
- Former employees also suggested that the unusable waste oil was discarded on site. One such area routinely pointed out was the company ball-field located on the premises. The ball-field is no longer identifiable; however, the former employees pointed to the general location of the ball field. There are two open tracts in this general area. Another area alluded to by former employees was along the back fence line (western edge of the property) along a railway line. Selection of subsurface sampling locations took these factors into consideration.
- The conventional wisdom was that the heat-treating oil contained Polychlorinated Biphenyls PCBs. In 1993, New York State Department of Environmental Conservation (NYSDEC) undertook a limited Record of Decision (ROD) to remove PCB contaminated soil from a parcel of land sold during the liquidation process along with the Schatz name.
- The analytical parameters chosen were:
    - Target Analyte List Metals (TAL-Metals). The presumption being that the discarded oils would contain metal fines from the manufacturing process.
    - Volatile Organic Analyses (VOA). The presumption being that the oil coating the machined parts would have to be removed.
    - Semi-Volatile Organic analyses (SVOA). The presumption being that the oils would contain compounds listed in the SVOA fraction.
    - Polychlorinated Biphenyls (PCB). The NYSDEC ROD was limited to the southernmost parcel sold during the liquidation and did not address potential contamination in the remaining three parcels that comprise EPA's Schatz Plant Removal Action Site.
    - The laboratory to be used would be the same laboratory solicited by the Emergency Response and Remedial
- The initial approach considered for assessing the subsurface soil was with the aid of a geoprobe; however, weathered shale/bedrock a few feet beneath the surface was observed at a nearby construction site. As a result, the test-pit technique was considered.

Modifications to the Approach

- Samples collected from the first two rounds of test-pits (TP-01 to TP-19) were submitted to the ERRS procured laboratory as planned. In the case of four test-pits, the SVOA fraction yielded low results which were incongruous with the clearly observable oil staining of the soil (will be further discussed in this document). The initial assumption was that there was a matrix interference leading to a low yield within the SVOA fraction. The ERRS procured laboratory was unable to perform a Matrix Spike/Matrix Spike Duplicate (MS/MSD) because it was not in the original scope. EPA, Region II's laboratory in Edison (Edison Lab) was contacted. The Edison lab agreed to run MS/MSD if sufficient volume from the original samples were available. Edison Lab would also reanalyze the TAL-Metals, VOA, SVOA and PCB. Moreover, Edison Lab also agreed to run Total Petroleum Hydrocarbons (TPHC) analyses. The unused portion of a sample from each of the four test-pits in questions were retrieved and submitted to the Edison Lab. All future analyses was to be performed by the Edison lab.

- Because of tenancy occupancy and storage, several building floor areas were not accessible for test-pitting. These areas are the building occupied by Sarjo's, M&O Sanitation, ACME Caster and the area where automobile engines are stored. The area once leased by a day care center was also omitted because of the inability to access the interior by the deeded equipment.

- A scrap metal merchant was consulted to determine the types of metal typically found in steel and metal used in bearing manufacture. Aluminum, beryllium, cadmium, cobalt, chromium, copper, magnesium, manganese, nickel, lead and zinc were cited as typically present as intended metal or as an impurity. He also indicated that molybdenum is metal commonly used in steel to impart desired characteristics. The owner of ACME Casters, one of the tenants, provided a metals composition specification sheet provided by his supplier for the steel he purchases. The Edison Lab, though not part of the TAL-Metals, agreed to run molybdenum analyses. Samples collected from Test-Pits 20 through TP-33 included molybdenum analyses.

Observations & Results

- The Schatz Plant Site is situated approximately 0.9miles due east of the Hudson River at an elevation of approximately 190ft. The Hudson River is at elevation of approximately 10ft; thus, there is a 180ft drop elevation in a span of about a mile.

- There are two potable water intakes along the Hudson River west of the site; one is a distance approximately 1.0miles the other is 1.5miles.

- 33 test-pits have been dug.

- Groundwater infiltration was observed in 11 of the 33 test-pits dug

- In 13 of the 33 test-pits dug, weathered shale/bedrock was observed. Of the weathered shale encountered, only in one instance was the dip at 0°, the remainder were between 45° and 90°.

- The numbering scheme is as follows. Each test-pit location is identified by the first two numbers, the number following the location ID is the depth at which a sample was collected. E.g.: samples TP-02, 1' and TP-02, 2' and TP-02, 3' were collected from the same test-pit, but at 1foot, 2feet and 3feet. Note: Sample TP-10, 43" was collected at 43 inches (3.58ft)

- Samples were collected at points where the subsurface soil appeared to not be native and undisturbed as opposed to a pre-specified interval. This was done in order to minimize analytical costs.

- Sampling took place along the sidewalls of the test-pit to avoid cross-contamination with soil sloughing off as the test-pits are being dug.

- Not all Test Pits were sampled. If the subsurface appeared visually clean and undisturbed native soil, sampling was omitted

- The initial assumption was that there was a matrix interference leading to the low yield. A chemist with ERT was consulted. The potential did exist for matrix interference; instead of running a matrix spike and matrix spike duplicate (MS/MSD) the better option would be to re-run the analyses if at all possible. Subsequently, US EPA, Region II's laboratory in Edison (Edison Lab) was consulted.
    - Edison Lab will re-analyze four samples for the original parameters; TAL-Metals, VOA, SVOA, PCB
    - The four samples to be re-analyzed were samples collected from TP-02, TP-03, TP-17 and TP-18; the ones exhibiting the greatest saturation of oily-water (the results are listed in a separate spreadsheet)
    - Edison Lab will run MS/MSD on two of the samples
    - Edison Lab will add Total Petroleum Hydrocarbons (TPHC) analyses.
    - All subsequent analyses will be conducted by the Edison Lab.
    - To maintain sample integrity for comparative purposes and to avoid re-digging the test pits in question, the unused portions of the samples were retrieved from the original laboratory and submitted to the Edison Lab
    - Edison Lab agreed to review the initial analytical reports from the private laboratory.
    - After their review, the Edison Lab did not see any issues with the work conducted by the private laboratory and the MS/MSD runs were with acceptable levels
- Test-pit TP-14 was dug in the vicinity of a cooling water cistern depicted in the 1938 Tax Map and no longer visible. During the excavation, the cistern was found buried along with the remnants of the associated pump house. A 10,000gallon tank in the same general area was not found; the exploration was limited by the reach of the mini-excavator used in the test-pit digging.

- The third and final round of test-pits, TP-20 through TP-33, was conducted between 10-05-10 and 10-06-10.
    - For several days prior to the test-pit excavation, the Poughkeepsie, New York area sustained persistent and heavy rain. The rain continued into mid-afternoon of the 5th.
    - Though in several instances perched water table was encountered, the subsurface was not as saturated as expected; the perched water table may be fast draining.
    - A tax map was found in one of the offices; it partially depicted the location of the historic ball-field. Measurements were taken to pinpoint its location. The location identified now has office trailers staged and made it difficult to excavate test-pits. One test-pit was dug in the area; the analytical results were below Subpart 375-6 except for acetone.
    - There is a tract of cleared land just north northwest of the tentatively located ball-field; the two areas are separated by a grove of trees/bushes. Three test-pits, TP-23, TP-24 and TP-25, were excavated in this tract of land.
        - These three pits contained heavily oil stained soil with a distinctive petroleum odor to it.
        - During the excavation of these three test-pits, tow tires, pails, remnants of steel drums and a whitish pasty material, wood and paper were unearthed. This area is clearly a disposal site and in all likelihood the area referenced by former employees.
        - In test-pits TP-23 and TP-24, perched water table was noted at 7.1ft and 8.5ft respectfully. In test-pit TP-25, the weathered shale/bedrock was encountered at 4.8ft below grade.

- All results have been tabulated and compared to the NYSDEC Subpart 375-6 Remedial Program Soil Cleanup Objectives. The values are in mg/kg.
    - For each contaminant in a particular sample that exceeded any one of the NYSDEC Subpart 375-6 criteria, the colour assigned was that of the criteria with the highest value. E.g.: in sample TP-09, I', cadmium was detected at 34mg/kg. The commercial level (dark green) is 9.3mg/kg and the industrial level is 60mg/kg (light green), hence the detected value of 34mg/kg was assigned the dark green colour code.
    - In the case of several contaminants listed in Subpart 375-6, the protection of groundwater value is less than other criteria; cadmium is one such example. The colour coding still followed the scheme described in the previous bullet.
    - A contaminant is highlighted in yellow if it was detected in any one of the samples.
- Also included is the Test-Pit Log. The log documents the visual observations of the subsurface at each Test-Pit
- The first round of test-pits, TP-01 through TP-10, was dug between 07-20-10 and 07-22-10. Samples collected from these test-pits were submitted to an ERRS procured laboratory.
    - Test-pits TP-01 through TP-06 were dug beneath one of the buildings. A road-saw was used to cut an approximate 2ftx8ft section of the foundation, which in areas was 12 inches thick.
    - Upon excavating TP-02 and TP-03, perched groundwater began infiltrating the test-pit. Oil like odor and oil sheen was noted. The distance between the two test-pits is approximately 150ft. This is in the same general area a former employee noted oily material exuding from the wooden floor planks when ever heavy equipment rolled over it; warranting the removal of the floor planks.
    - Upon receipt of the analytical data, the SVOA fraction yielded nominal results, which was unexpected in samples collected from test-pits TP-02 and TP-03 considering the oily water and visible sheen observed in each of the pits.
- The second round of test-pits, TP-11 through TP-19 was dug between 08-10-10 and 08-11-10 and the samples collected were submitted to the ERRS procured laboratory.
    - Two of the test pits, TP-17 and TP-18, were dug adjacent to the heat treating building, along its eastern wall. These two test-pits was saturated with oily-water. The dig in each of these pits was suspended due to concern of contributing to a potential vertical migration of contaminants
    - TP-15 and TP-16 were dug adjacent to the western wall of the heat treating building and no water layer was observed.
    - The heat treating building (Buildings 9 and 12) was first constructed in 1910 and subsequently expanded in several phases through 1926. It is a steel I-beam framed building with corrugated steel walls; the bottom 2 or so feet is composed of brick. In the larger section labeled Building 9 there were a total of 13 pits. Three of the pits still contain rectangular tanks, presumably all the pits contained metal tanks inside of them. Best indications are that these pits/tanks contained heat treating oil. The fabricated material would be heat treated by immersing them in oil to impart the desired qualities. During the current removal action the oily water contained in these pits/tanks were pumped out and shipped for off-site disposal, approximately 25,000gallons. The residual sludge was solidified in place and removed and is awaiting disposal. This process was completed by 11/01/10. On the week of 11/08/10 several inches of oily water had re-entered several of the pits/vats, presumably from groundwater infiltration; there was no appreciable rain and the roof is intact enough to exclude rainwater.
    - As in the previous round of analytical work, the SVOA fraction detected was below levels expected, particularly for samples collected from test-pits TP-17 and TP-18.

- Test-pits TP-31 and TP-32 were dug along the fence line between the site and the operating Schatz Bearing Corporation. These two test-pits along with test-pits TP-11 and TP-12 collected in the August event completed the assessment along the Schatz Bearing Corporation and Schatz Plant Site Boundary. The NYSDEC ROD addressed the contaminated soil on the Schatz Bearing Corporation property in the vicinity of the boundary with the Schatz Plant Site.